

3. Wet the suction cup of the lapping stick and stick it onto the head of the valve. Lap the valve to the seat by rotating the lapping stick in both directions (**Figure 71**). Every 5 to 10 seconds, rotate the valve 180° in the valve seat; continue lapping until the contact surfaces of the valve and the valve seat are a uniform grey. Stop as soon as they are, to avoid removing too much material.

4. Thoroughly clean the cylinder head and all valve components in solvent or detergent and hot water to remove all grinding compound. Any compound left on the valves or the cylinder head will end up in the engine and will cause damage.

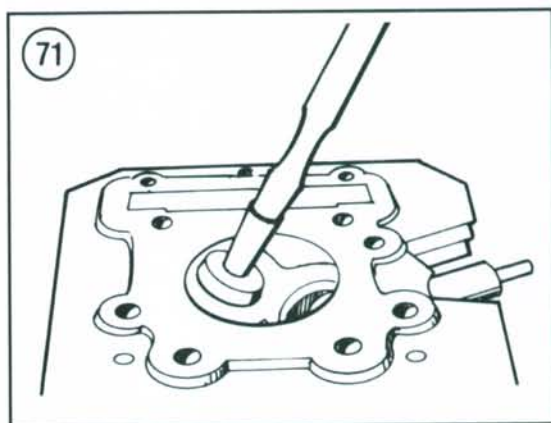
5. After the lapping has been completed and the valve assemblies have been reinstalled into the head, the valve seal should be tested. Check the seal of each valve by pouring solvent into each of the intake and exhaust ports. The solvent should not flow past the valve seat and the valve head. Perform on all sets of valves. If fluid leaks past any of the seats, disassemble that valve assembly and repeat the lapping procedure until there is no leakage.

6. If the cylinder head and valve components were cleaned in detergent and hot water, apply a light coat of engine oil to all bare metal surfaces to prevent any rust formations.

may be purchased or may be a homemade unit of wood. See **Figure 74** for dimensions.

Inspection

The following procedure requires the use of highly specialized and expensive measuring instruments. If such equipment is not readily available,



CYLINDER

Removal

1. Remove the cylinder head cover and camshaft and the cylinder head as described in this chapter.

2. Remove the camshaft chain slipper (**Figure 72**).

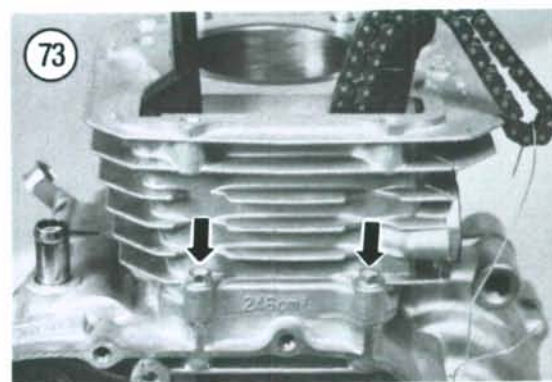
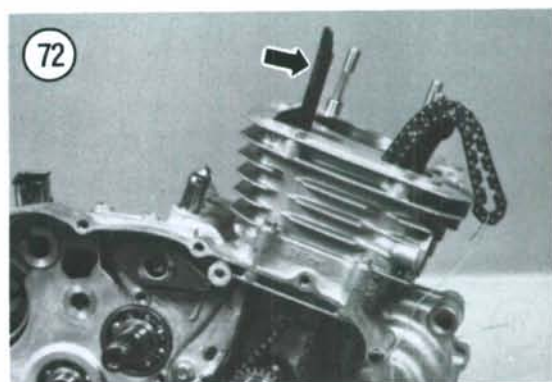
3. Remove the bolts (**Figure 73**) on the right-hand side of the cylinder.

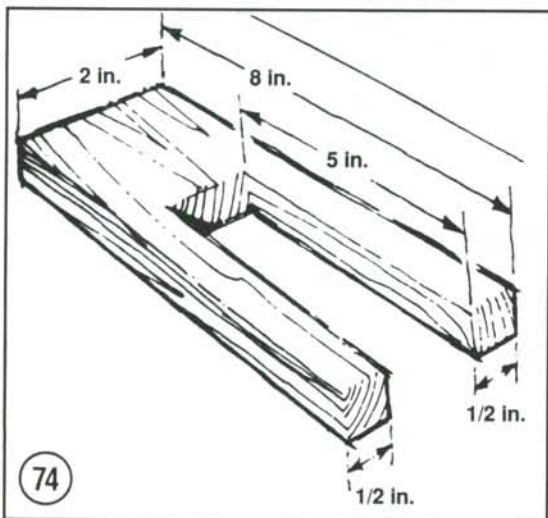
4. Loosen the cylinder by tapping around the perimeter with a rubber or plastic mallet. If necessary, gently pry the cylinder loose with a broad-tipped screwdriver.

5. Pull the cylinder straight out and off of the crankcase studs. Work the cam chain wire through the opening in the cylinder and retie the wire to the crankcase so the chain will not fall into the crankcase.

6. Remove the cylinder base gasket and discard it. Remove the dowel pins from the crankcase studs.

7. Install a piston holding fixture under the piston to protect the piston skirt from damage. This fixture





have the measurements performed by a dealer or qualified machine shop.

1. Soak with solvent any old cylinder head gasket material on the cylinder. Use a broad-tipped *dull* chisel and gently scrape off all gasket residue. Do not gouge the sealing surface as oil and air leaks will result.

2. Measure the cylinder bore with a cylinder gauge (**Figure 75**) or inside micrometer at the points shown in **Figure 76**.

3. Measure in 2 axes—in line with the piston-pin and at 90° to the pin. If the taper or out-of-round is 0.10 mm (0.004 in.) or greater, the cylinder must be rebored to the next oversize and a new piston installed.

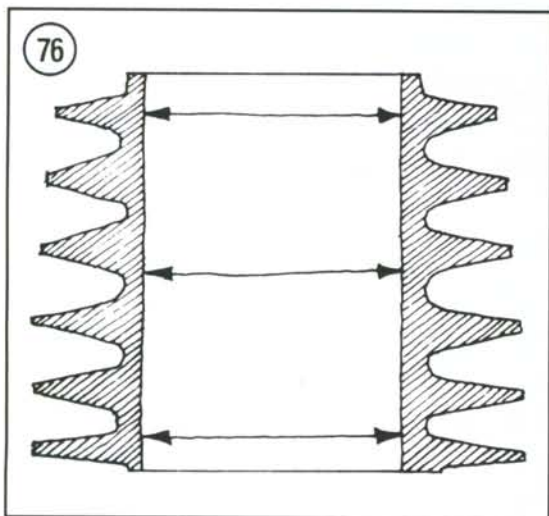
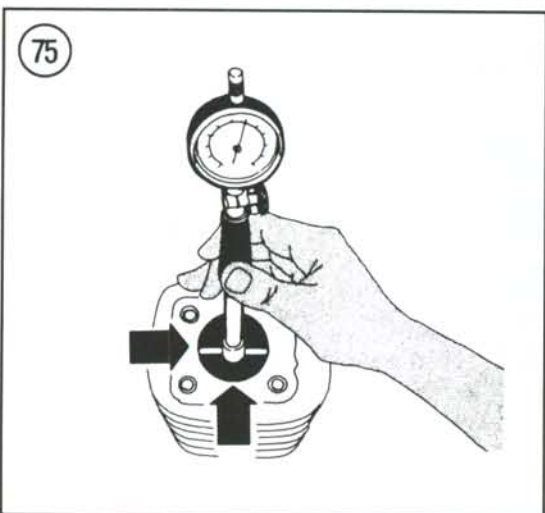
NOTE

The new piston should be obtained before the cylinder is rebored so that the piston can be measured; slight manufacturing tolerances must be taken into account to determine the actual size and working clearance. Piston-to-cylinder wear limit is listed in **Table 1**.

4. Check the cylinder wall (**Figure 77**) for scratches; if evident, the cylinder should be rebored.

NOTE

The maximum wear limit on the cylinder is listed in **Table 1**. If the cylinder is worn to this limit, it must be replaced. Never rebore a cylinder if the finished rebore diameter will be this dimension or greater.



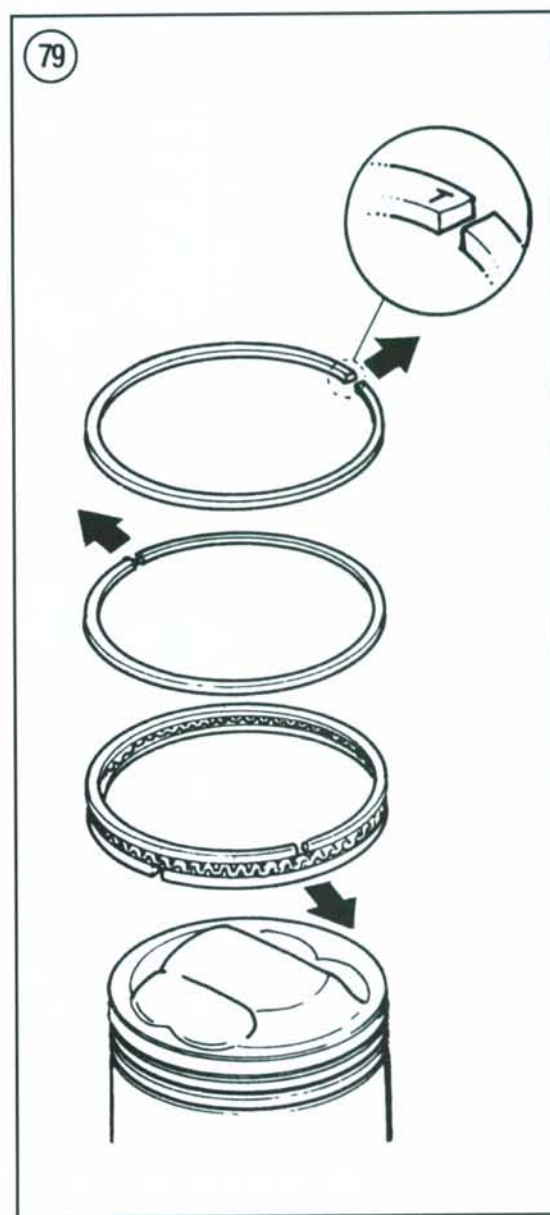
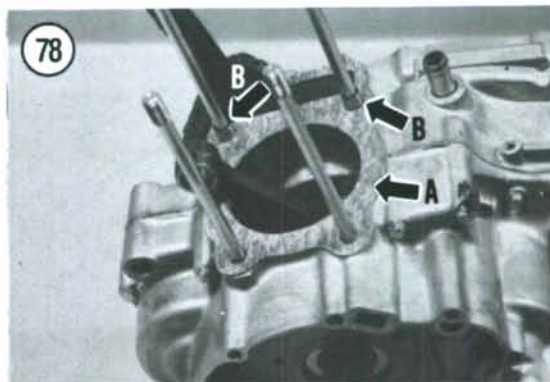
Installation

1. Check that the top surface of the crankcase and the bottom surface of the cylinder are clean prior to installing a new base gasket.

NOTE

*The piston is removed in **Figure 78** for clarity. It is not necessary to remove the piston for this procedure.*

2. Install a new cylinder base gasket (A, **Figure 78**).
3. Install the dowel pins (B, **Figure 78**) on the left-hand crankcase studs.
4. Install a piston holding fixture under the piston.
5. Make sure the end gaps of the piston rings are *not* lined up with each other—they must be staggered (**Figure 79**). Lightly oil the piston rings and the inside of the cylinder bores with assembly oil or fresh engine oil.
6. Carefully feed the cam chain and wire up through the opening in the cylinder and tie it to the engine.
7. Install the cylinder and slide it down onto the crankcase studs. Guide the camshaft chain and camshaft tensioner assembly into the camshaft chain slot in the cylinder.
8. Carefully feed the camshaft chain wire up through the opening in the cylinder and tie the wire to the exterior of the engine.
9. Start the cylinder down over the piston. Compress each piston ring with your fingers as it enters the cylinder.
10. Slide the cylinder down until it bottoms on the piston holding fixture.
11. Remove the piston holding fixture and slide the cylinder down into place on the crankcase.
12. Install the camshaft chain slipper (**Figure 72**).
13. Install the cylinder head and cylinder head cover as described in this chapter.
14. Adjust the valves as described in Chapter Three.
15. Follow the *Break-in Procedure* in this chapter if the cylinder was rebored or honed or a new piston or piston rings were installed.



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